CLAIMS

What is claimed is:

1. An apparatus comprising:
one or more stackable fiber optic transceivers, wherein each transceiver includes an electrical substrate having two sides with one or more electrical traces on each side terminated at an edge of the substrate; and wherein the electrical traces on the substrate align with one or more traces at predetermined positions on a motherboard, wherein the predetermined position of each trace on the motherboard is sufficiently close to a corresponding trace on the electrical substrate so that melted solder on one or more of the motherboard traces can wick up onto the substrate traces to form an electrical connection.

2. The apparatus of claim 1, wherein a density of soldered electrical traces at the edge of the electrical substrate is about 40 soldered traces/inch/side or greater.

3. The apparatus of claim 1, wherein the electrical traces on the electrical substrate and the motherboard are connected with one or more circuit lines.

4. The apparatus of claim 1, wherein each electrical trace can carry data at a speed greater than 100MHz.

5. The apparatus of claim 1, wherein each electrical substrate is made of a material selected from the group consisting of ceramic and plastic.

6. The apparatus of claim 1, wherein the solder comprises a material selected from the group consisting of Pb-Sn, In-Sn, Cu-Ni, and Ag.

7. The apparatus of claim 1, wherein the solder is in the form of a solder paste.

8. The apparatus of claim 1, wherein the solder is in the form of one or more solder balls.

9. The apparatus of claim 8, wherein the solder balls have a diameter of about 350 microns.

10. The apparatus of claim 1, further comprising one or more molded housings for retaining solder adjacent the traces on the electrical substrate.

11. The apparatus of claim 10, wherein the molded housings hold solder on both sides of the electrical substrate.

12. The apparatus of claim 10, wherein the molded housing prevents cross connection between the electrical traces.

13. The apparatus of claim 10, wherein the molded housing has alignment features that conform to alignment features on the electrical substrate.

14. The apparatus of claim 10, wherein the molded housing comprises a material selected from the group consisting of ceramic, plastic, and metal.

15. The apparatus of claim 10, wherein the molded housing is patterned with voids or pockets.

16. The apparatus of claim 1, wherein the solder protrudes outside of the molded housing.

17. The apparatus of claim 1, wherein one or more of the electrical substrates have alignment features that conform to alignment features on the motherboard.

18. The apparatus of claim 1, wherein the fiber optic transceivers are stacked by heat drain profiles.

19. The apparatus of claim 18, wherein the heat drain profiles establish mechanical and thermal connection between the fiber optic transceivers.

20. The apparatus of claim 19, wherein the heat drain profiles drain the heat created during functional operation of the fiber optic transceivers into a heat sink base.

21. An apparatus comprising:

a) a motherboard aligned, wherein the mother board has one or more electrical traces that align with one or more of the electrical traces on the electrical substrate; and

b) one or more stackable fiber optic transceivers, aligned perpendicularly with respect to the motherboard, wherein each transceiver includes an electrical substrate having two sides with one or more electrical traces on each side terminated at an edge of the substrate; and wherein the electrical traces on the substrate align with one or more traces at predetermined positions on the motherboard, wherein the predetermined position of each trace on the motherboard is sufficiently close to a corresponding trace on the electrical substrate so that melted solder on one or more of the motherboard traces can

wick up onto the substrate traces to form an electrical connection.

22. The apparatus of claim 21, wherein the electrical traces on the electrical substrate and the motherboard are located close enough so that the melted solder disposed on the electrical traces on the motherboard physically touches the electrical traces on the electrical substrate.

23. The apparatus of claim 21, wherein the motherboard is made of a material selected from the group consisting of ceramic, plastic, and metal.

24. The apparatus of claim 21, wherein the electrical substrate is made of a material selected from the group consisting of ceramic and plastic.

25. The apparatus of claim 21, wherein the electrical substrate has alignment features.

26. The apparatus of claim 21, further comprising a molded housing for retaining solder in predetermined position adjacent one or more of the electrical traces on the motherboard.

27. The apparatus of claim 26, wherein the molded housing holds the solder on both sides of the electrical substrate.

28. The apparatus of claim 26, wherein the molded housing prevents cross connection between the electrical traces.

29. The apparatus of claim 26, wherein the molded housing has alignment features that conform to the alignment features on the electrical substrate.

30. The apparatus of claim 26, wherein the molded housing comprises a material selected from the group consisting ceramic, plastic, and metal.

31. The apparatus of claim 26, wherein the molded housing is patterned with voids or pockets.

32. The apparatus of claim 26, wherein the solder protrudes outside of the molded housing.

33. The apparatus of claim 21, wherein a density of soldered electrical traces at the edge of the electrical substrate is about 40 soldered traces/inch/side or greater.

34. The apparatus of claim 21, wherein one or more of the electrical traces on the electrical substrate carries data at a speed greater than 100MHz.

35. The apparatus of claim 21, wherein the electrical traces on the electrical substrate and the motherboard are connected to one or more circuit lines.

36. The apparatus of claim 21, wherein the solder comprises a material selected from the group consisting of Pb-Sn, In-Sn, Cu-Ni, and Ag.

37. The apparatus of claim 21, wherein the solder is in the form of a solder paste.

38. The apparatus of claim 21, wherein the solder is in the form of one or more solder balls.

39. The apparatus of claim 38, wherein the solder balls have a diameter of about 350 microns.

40. The apparatus of claim 21, wherein the fiber optic transceivers are stacked by heat drain profiles.

41. The apparatus of claim 40, wherein the heat drain profiles establish mechanical and thermal connection between the fiber optic transceivers.

42. The apparatus of claim 41, wherein the heat drain profiles drain the heat created during functional operation of the fiber optic transceivers into a heat sink base.

43. A method of assembling a stackable fiber optic transceiver apparatus comprising the steps of:

a) providing a motherboard aligned, having one or more electrical traces;

b) providing two or more stackable fiber optic transceivers wherein each transceiver includes an electrical substrate having two sides with one or more electrical traces on each side terminated at an edge of the substrate; and wherein

c) aligning one or more stackable fiber optic transceivers, perpendicularly with respect to the motherboard, such that the electrical traces on the substrate align with one or more traces at predetermined positions on the motherboard,

d) placing solder on one or more of the traces on the mother board; and

e) melting the solder, wherein the predetermined position of each trace on the motherboard is sufficiently close to a corresponding trace on the electrical substrate so

that melted solder wicks up onto the substrate traces to form an electrical connection.

44. The method of claim 43, wherein the solder is in the form of one or more solder balls.

45. The method of claim 44, wherein the solder balls have a diameter of about 350 microns.

46. The method of claim 43, wherein a molded housing retains the solder in predetermined position adjacent one or more electrical traces on the motherboard.